

## A San Andreas-sized Strike-slip Fault on Europa

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Astypalaea Linea, a lineament in the extreme southern hemisphere of Europa, has been found to be a global-scale strike-slip fault, based on a palinspastic reconstruction of landscape on reprojected Voyager 2 images. The fault accommodates 35 km of right-lateral offset and extends at least 810 km - a length comparable to the San Andreas Fault in California. It exhibits familiar strike-slip features including braids and pull-aparts. Straight segments of the fault are concentric about an Euler pole provisionally located at (-48°, 247.25°W). Spanning over 29° from (-60°, 191°W) to (-78.5°, 268.5°W) Astypalaea Linea is the longest strike-slip fault yet identified on Europa.

The fault is consistent with differential stress magnitudes and stress directions predicted for high European latitudes due to possible non-synchronous rotation (tidal bulge in its present location) (Greenberg and Weidenschilling, 1984; Helfenstein and Parmentier, 1985). Extension on neighboring gray band Thynia Linea matches the same stress field (Pappalardo and Sullivan, 1996); thus, Astypalaea Linea and Thynia Linea may be part of a south polar deformation zone which acts as a "structural set" (Lucchitta and Soderblom, 1982). Analogous structures may exist at the European north pole, although factors such as a possible global structural dichotomy (Lucchitta and Soderblom, 1981) may affect their occurrence. Lateral crustal motion, as implied by the fault, is consistent with a subsurface viscous horizon structurally decoupling the outer layer of the icy Jovian satellite from its interior (e.g. Schenk and McKinnon, 1989).

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Special instructions: Regarding the Category, although the results are closely related to Galileo results, they were made using Voyager images in preparation for Galileo. Tue Aug 27 15:34:02 CDT 1996

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